

Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions  
(formerly Eaton)

Brand: McGRAW-EDISON

Report Number: P400570

Luminaire Tested: **TT-D4-750-U-T4-PM**

Issue Date: 5/19/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P400570  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-1908-473-26)  
Test Lab: INNOVATION CENTER  
Issue Date: 5/19/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: MCGRAW-EDISON  
Catalog Number: TT-D4-750-U-T4-PM  
Description: TOPTIER LED SITE LUMINAIRE  
5000K, 70 CRI LEDS AND DRIVE LANE DISTRIBUTION  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 6314 lumens  
Efficiency: N/A  
Efficacy: 105.6 lumens/watt  
Luminous Opening: Circular (Dia: 1.12' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B2 - U0 - G3

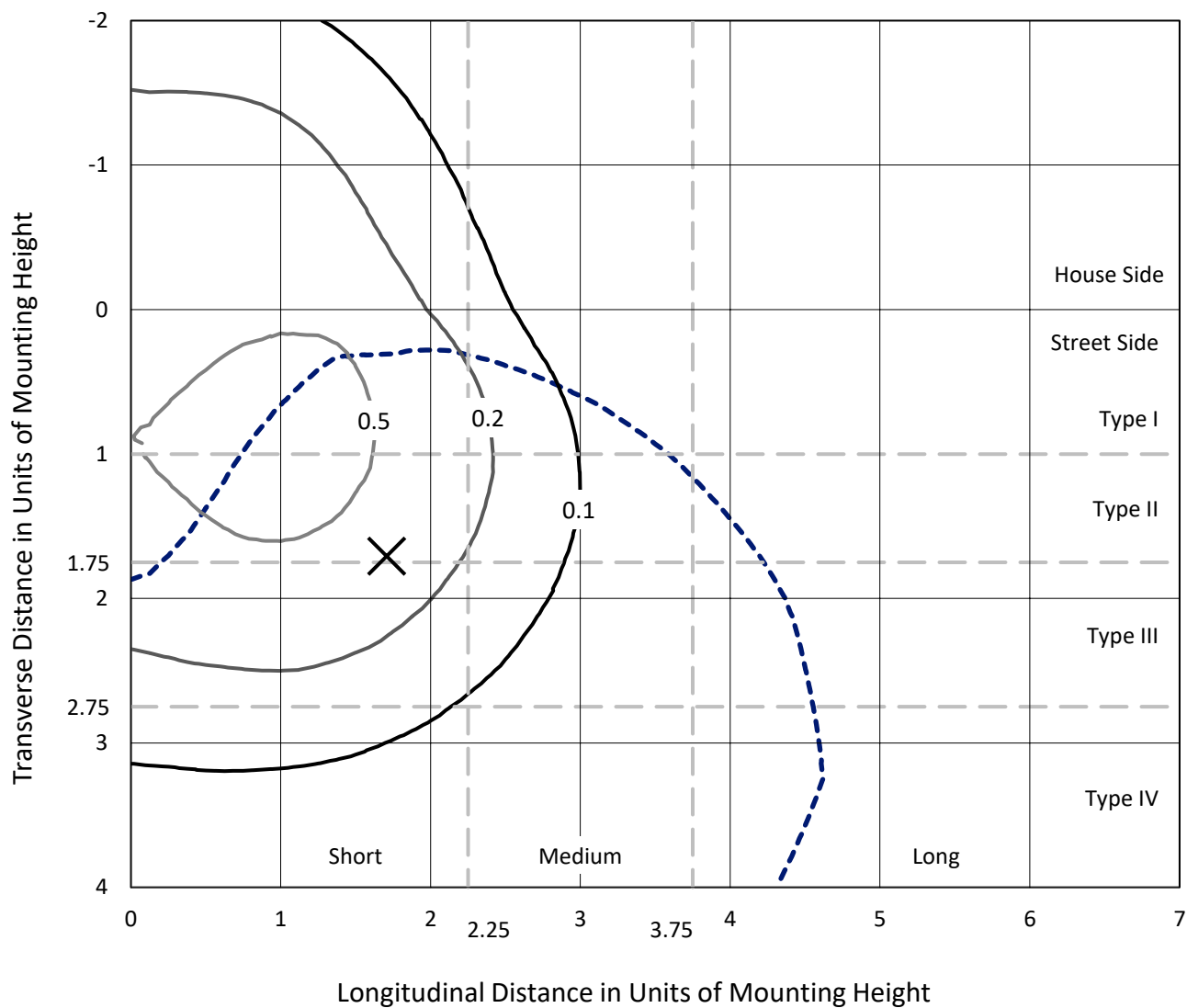
Input Watts (W): 59.8  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



REPORT NUMBER: P400570  
 CATALOG NUMBER: TT-D4-750-U-T4-PM

## Iso-Footcandle Lines of Horizontal Illumination

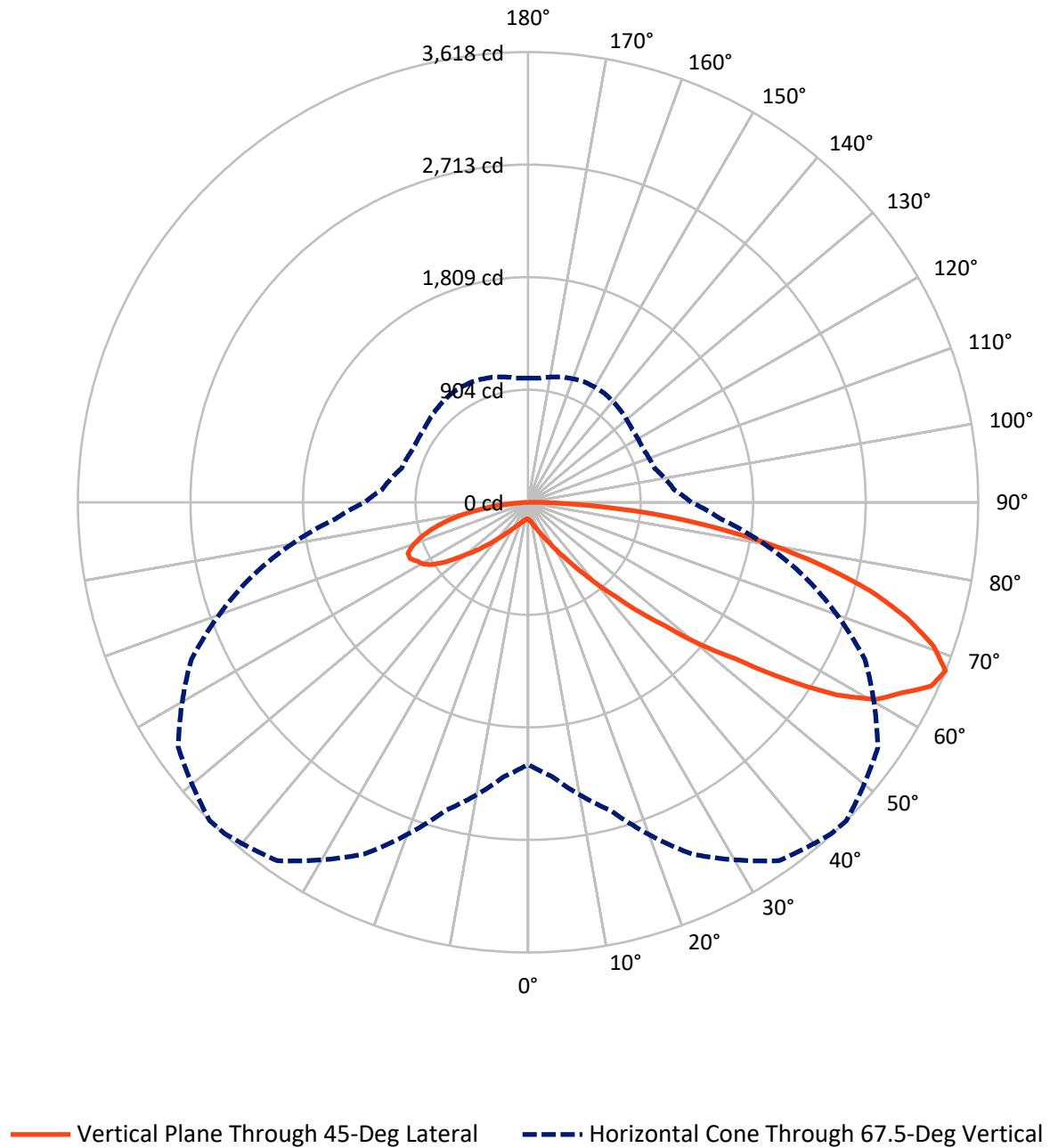
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 0.8 fc  
 Type IV - Short - N/A

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## Luminous Intensity Polar Plot



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CATALOG NUMBER: TT-D4-750-U-T4-PM

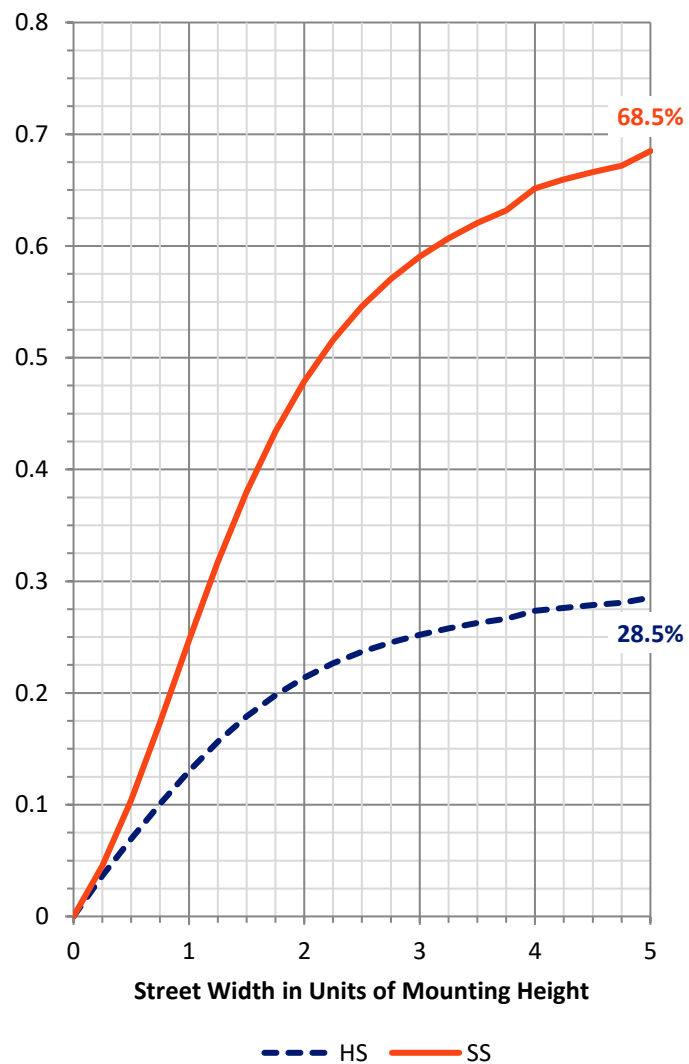
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1839.9   | 0.0    | 1839.9 |
|                    | % Fixture | 29.1     | 0.0    | 29.1   |
| <b>Street Side</b> | Lumens    | 4474.1   | 0.0    | 4474.1 |
|                    | % Fixture | 70.9     | 0.0    | 70.9   |
| <b>Total</b>       | Lumens    | 6314.0   | 0.0    | 6314.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 14.1   | 0.2       |
| 10°-20°   | 52.4   | 0.8       |
| 20°-30°   | 123.9  | 2.0       |
| 30°-40°   | 280.3  | 4.4       |
| 40°-50°   | 625.0  | 9.9       |
| 50°-60°   | 1256.4 | 19.9      |
| 60°-70°   | 1845.3 | 29.2      |
| 70°-80°   | 1622.7 | 25.7      |
| 80°-90°   | 494.0  | 7.8       |
| 90°-100°  | 0.0    | 0.0       |
| 100°-110° | 0.0    | 0.0       |
| 110°-120° | 0.0    | 0.0       |
| 120°-130° | 0.0    | 0.0       |
| 130°-140° | 0.0    | 0.0       |
| 140°-150° | 0.0    | 0.0       |
| 150°-160° | 0.0    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-90°    | 6314.0 | 100.0     |
| 0°-180°   | 6314.0 | 100.0     |

**Coefficient of Utilization**



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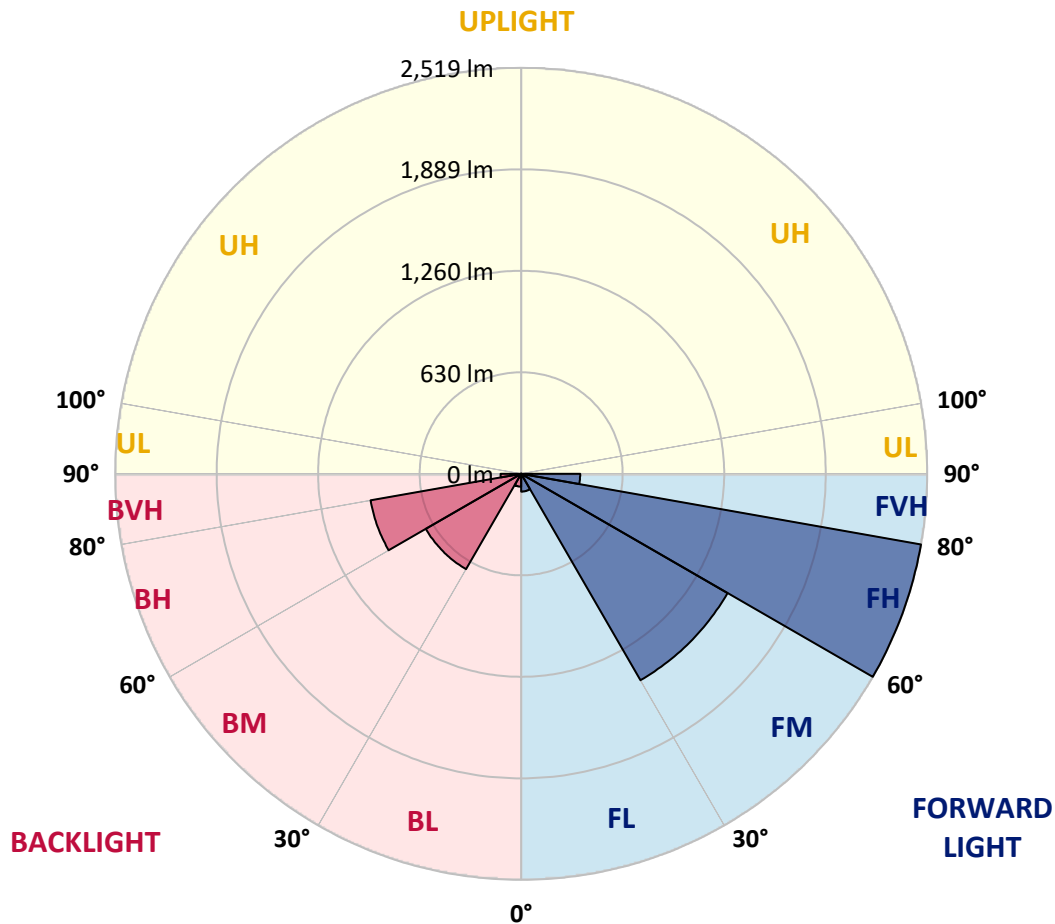
CATALOG NUMBER: TT-D4-750-U-T4-PM

**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|------|-------------|--------|-----------|-------------------------|------|---------|
|      |             |        |           | B                       | U    | G       |
| FL   | (0°-30°)    | 110.3  | 1.7       |                         |      |         |
| FM   | (30°-60°)   | 1478.6 | 23.4      |                         |      |         |
| FH   | (60°-80°)   | 2519.2 | 39.9      |                         |      | G2/5000 |
| FVH  | (80°-90°)   | 366.0  | 5.8       |                         |      | G3/500  |
| BL   | (0°-30°)    | 80.1   | 1.3       | B0/110                  |      |         |
| BM   | (30°-60°)   | 683.1  | 10.8      | B1/1000                 |      |         |
| BH   | (60°-80°)   | 948.8  | 15.0      | B2/1000                 |      | G2/1000 |
| BVH  | (80°-90°)   | 128.0  | 2.0       |                         |      | G2/225  |
| UL   | (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH   | (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B2-U0-G3**

Type IV Short



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 15°    | 25°    | 35°    | 42.5°  | 45°    | 55°    | 65°    | 75°    | 85°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 137.0  | 137.0  | 137.0  | 137.0  | 137.0  | 137.0  | 137.0  | 137.0  | 137.0  | 137.0  | 137.0  |
| 2.5°  | 142.9  | 141.7  | 141.7  | 141.7  | 140.5  | 140.5  | 140.5  | 140.5  | 139.3  | 139.3  | 139.3  |
| 5°    | 151.1  | 149.9  | 151.1  | 148.8  | 147.6  | 147.6  | 146.4  | 146.4  | 145.2  | 144.0  | 142.9  |
| 7.5°  | 162.9  | 161.8  | 161.8  | 159.4  | 158.2  | 157.0  | 157.0  | 154.7  | 153.5  | 151.1  | 148.8  |
| 10°   | 175.9  | 175.9  | 174.7  | 173.6  | 171.2  | 168.8  | 168.8  | 165.3  | 164.1  | 160.6  | 157.0  |
| 12.5° | 191.3  | 191.3  | 191.3  | 188.9  | 186.5  | 185.4  | 183.0  | 180.6  | 177.1  | 171.2  | 167.7  |
| 15°   | 210.2  | 210.2  | 210.2  | 207.8  | 205.4  | 203.1  | 201.9  | 197.2  | 191.3  | 185.4  | 178.3  |
| 17.5° | 233.8  | 231.4  | 231.4  | 229.0  | 226.7  | 225.5  | 223.1  | 218.4  | 210.2  | 203.1  | 193.6  |
| 20°   | 259.7  | 258.6  | 257.4  | 257.4  | 255.0  | 252.7  | 251.5  | 244.4  | 235.0  | 222.0  | 210.2  |
| 22.5° | 289.3  | 288.1  | 288.1  | 290.4  | 289.3  | 285.7  | 285.7  | 275.1  | 262.1  | 246.8  | 229.0  |
| 25°   | 325.9  | 324.7  | 327.0  | 331.8  | 331.8  | 329.4  | 325.9  | 315.2  | 296.3  | 275.1  | 253.8  |
| 27.5° | 366.0  | 364.8  | 369.5  | 377.8  | 380.2  | 376.6  | 374.3  | 362.5  | 341.2  | 312.9  | 282.2  |
| 30°   | 414.4  | 415.6  | 428.6  | 438.0  | 443.9  | 441.6  | 440.4  | 427.4  | 393.2  | 360.1  | 320.0  |
| 32.5° | 473.4  | 469.9  | 486.4  | 501.8  | 512.4  | 518.3  | 514.8  | 499.4  | 469.9  | 418.0  | 367.2  |
| 35°   | 536.0  | 537.2  | 557.3  | 579.7  | 604.5  | 606.9  | 613.9  | 598.6  | 558.5  | 497.1  | 426.2  |
| 37.5° | 617.5  | 608.0  | 634.0  | 676.5  | 706.0  | 732.0  | 727.3  | 717.8  | 670.6  | 589.1  | 492.3  |
| 40°   | 690.7  | 688.3  | 724.9  | 784.0  | 838.3  | 876.0  | 880.8  | 869.0  | 806.4  | 690.7  | 563.2  |
| 42.5° | 774.5  | 781.6  | 832.4  | 913.8  | 996.5  | 1050.8 | 1037.8 | 1031.9 | 958.7  | 811.1  | 660.0  |
| 45°   | 859.5  | 883.1  | 948.1  | 1066.1 | 1162.9 | 1240.9 | 1263.3 | 1243.2 | 1153.5 | 1001.2 | 782.8  |
| 47.5° | 962.2  | 994.1  | 1074.4 | 1233.8 | 1392.0 | 1482.9 | 1487.6 | 1547.8 | 1412.1 | 1184.2 | 910.3  |
| 50°   | 1098.0 | 1112.2 | 1224.3 | 1419.2 | 1636.4 | 1763.9 | 1800.5 | 1801.7 | 1665.9 | 1368.4 | 1054.3 |
| 52.5° | 1231.4 | 1242.1 | 1389.6 | 1641.1 | 1936.3 | 2081.5 | 2089.8 | 2135.8 | 1950.4 | 1665.9 | 1260.9 |
| 55°   | 1392.0 | 1387.3 | 1590.3 | 1892.6 | 2240.9 | 2452.2 | 2513.6 | 2576.2 | 2340.1 | 1900.9 | 1379.0 |
| 57.5° | 1547.8 | 1540.8 | 1785.2 | 2181.9 | 2657.7 | 2867.8 | 2918.6 | 2873.7 | 2523.1 | 1998.9 | 1436.9 |
| 60°   | 1691.9 | 1716.7 | 2014.2 | 2501.8 | 2980.0 | 3180.7 | 3214.9 | 3093.3 | 2641.1 | 2074.4 | 1473.5 |
| 62.5° | 1841.8 | 1891.4 | 2251.5 | 2768.6 | 3226.7 | 3370.8 | 3373.1 | 3230.3 | 2838.3 | 2220.8 | 1592.7 |
| 65°   | 1982.3 | 2061.4 | 2435.7 | 2996.5 | 3399.1 | 3543.2 | 3559.7 | 3431.0 | 3031.9 | 2348.3 | 1612.8 |
| 67.5° | 2106.3 | 2211.4 | 2563.2 | 3119.3 | 3516.0 | 3609.3 | 3617.5 | 3432.2 | 2985.9 | 2296.4 | 1557.3 |
| 70°   | 2206.7 | 2291.7 | 2642.3 | 3121.7 | 3434.5 | 3460.5 | 3454.6 | 3257.4 | 2858.4 | 2193.7 | 1464.0 |
| 72.5° | 2245.6 | 2315.3 | 2604.5 | 2975.3 | 3194.9 | 3189.0 | 3184.2 | 3002.4 | 2648.2 | 2022.5 | 1329.4 |
| 75°   | 2190.1 | 2210.2 | 2397.9 | 2662.4 | 2801.7 | 2834.8 | 2839.5 | 2675.4 | 2323.5 | 1768.6 | 1140.5 |
| 77.5° | 1961.1 | 1950.4 | 2094.5 | 2269.2 | 2374.3 | 2397.9 | 2393.2 | 2256.2 | 1948.1 | 1469.9 | 956.3  |
| 80°   | 1554.9 | 1577.4 | 1667.1 | 1782.8 | 1887.9 | 1913.8 | 1897.3 | 1793.4 | 1516.0 | 1146.4 | 734.4  |
| 82.5° | 1087.4 | 1114.5 | 1190.1 | 1277.5 | 1356.6 | 1356.6 | 1371.9 | 1271.6 | 1074.4 | 822.9  | 513.6  |
| 85°   | 586.8  | 571.4  | 654.1  | 753.3  | 809.9  | 820.6  | 826.5  | 793.4  | 664.7  | 497.1  | 304.6  |
| 87.5° | 96.8   | 103.9  | 128.7  | 197.2  | 224.3  | 259.7  | 276.3  | 216.1  | 131.1  | 83.8   | 61.4   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

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CATALOG NUMBER: TT-D4-750-U-T4-PM

**CANDELA DISTRIBUTION (continued):**

|       | 90°    | 95°    | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 137.0  | 137.0  | 137.0  | 137.0  | 137.0  | 137.0  | 137.0  | 137.0  | 137.0  | 137.0  | 137.0  |
| 2.5°  | 139.3  | 138.1  | 137.0  | 135.8  | 135.8  | 134.6  | 134.6  | 134.6  | 135.8  | 135.8  | 135.8  |
| 5°    | 142.9  | 141.7  | 140.5  | 139.3  | 137.0  | 137.0  | 137.0  | 137.0  | 137.0  | 137.0  | 137.0  |
| 7.5°  | 148.8  | 146.4  | 145.2  | 142.9  | 140.5  | 140.5  | 139.3  | 139.3  | 139.3  | 140.5  | 139.3  |
| 10°   | 155.8  | 153.5  | 151.1  | 147.6  | 146.4  | 145.2  | 144.0  | 144.0  | 145.2  | 145.2  | 144.0  |
| 12.5° | 164.1  | 162.9  | 158.2  | 154.7  | 152.3  | 151.1  | 149.9  | 151.1  | 149.9  | 151.1  | 151.1  |
| 15°   | 175.9  | 172.4  | 166.5  | 162.9  | 159.4  | 158.2  | 157.0  | 158.2  | 158.2  | 159.4  | 158.2  |
| 17.5° | 188.9  | 184.2  | 178.3  | 172.4  | 167.7  | 166.5  | 166.5  | 166.5  | 167.7  | 168.8  | 167.7  |
| 20°   | 204.3  | 198.4  | 190.1  | 183.0  | 178.3  | 177.1  | 177.1  | 178.3  | 179.5  | 180.6  | 180.6  |
| 22.5° | 219.6  | 214.9  | 203.1  | 193.6  | 191.3  | 190.1  | 188.9  | 191.3  | 193.6  | 194.8  | 196.0  |
| 25°   | 243.2  | 233.8  | 219.6  | 209.0  | 204.3  | 204.3  | 205.4  | 207.8  | 209.0  | 211.3  | 210.2  |
| 27.5° | 268.0  | 257.4  | 239.7  | 225.5  | 222.0  | 220.8  | 223.1  | 225.5  | 230.2  | 230.2  | 229.0  |
| 30°   | 302.2  | 284.5  | 262.1  | 249.1  | 239.7  | 240.9  | 244.4  | 247.9  | 252.7  | 255.0  | 255.0  |
| 32.5° | 341.2  | 322.3  | 291.6  | 271.6  | 266.8  | 268.0  | 269.2  | 275.1  | 279.8  | 284.5  | 281.0  |
| 35°   | 392.0  | 368.4  | 330.6  | 308.2  | 296.3  | 295.2  | 299.9  | 307.0  | 311.7  | 314.1  | 314.1  |
| 37.5° | 447.5  | 416.8  | 369.5  | 350.7  | 336.5  | 335.3  | 336.5  | 342.4  | 348.3  | 350.7  | 355.4  |
| 40°   | 514.8  | 477.0  | 421.5  | 390.8  | 380.2  | 377.8  | 382.5  | 390.8  | 390.8  | 394.3  | 395.5  |
| 42.5° | 597.4  | 549.0  | 487.6  | 447.5  | 434.5  | 434.5  | 433.3  | 440.4  | 440.4  | 440.4  | 438.0  |
| 45°   | 702.5  | 648.2  | 567.9  | 526.6  | 504.1  | 492.3  | 495.9  | 491.2  | 490.0  | 493.5  | 482.9  |
| 47.5° | 804.0  | 735.6  | 641.1  | 596.2  | 573.8  | 566.7  | 553.7  | 550.2  | 544.3  | 544.3  | 528.9  |
| 50°   | 922.1  | 837.1  | 746.2  | 682.4  | 661.2  | 641.1  | 630.5  | 613.9  | 596.2  | 592.7  | 586.8  |
| 52.5° | 1119.3 | 1013.0 | 870.1  | 801.7  | 747.4  | 727.3  | 702.5  | 681.2  | 660.0  | 643.5  | 652.9  |
| 55°   | 1199.5 | 1090.9 | 955.2  | 889.0  | 851.3  | 832.4  | 786.3  | 758.0  | 726.1  | 702.5  | 715.5  |
| 57.5° | 1239.7 | 1121.6 | 995.3  | 945.7  | 935.1  | 917.4  | 883.1  | 834.7  | 798.1  | 768.6  | 771.0  |
| 60°   | 1262.1 | 1138.2 | 1016.5 | 971.7  | 965.8  | 977.6  | 959.9  | 926.8  | 870.1  | 840.6  | 837.1  |
| 62.5° | 1348.3 | 1218.4 | 1076.8 | 1013.0 | 1000.0 | 1008.3 | 1013.0 | 992.9  | 945.7  | 906.7  | 896.1  |
| 65°   | 1366.0 | 1227.9 | 1088.6 | 1047.2 | 1048.4 | 1050.8 | 1054.3 | 1033.1 | 1009.5 | 961.1  | 951.6  |
| 67.5° | 1312.9 | 1177.1 | 1053.1 | 1018.9 | 1021.3 | 1048.4 | 1069.7 | 1068.5 | 1042.5 | 1001.2 | 997.7  |
| 70°   | 1232.6 | 1100.4 | 985.9  | 955.2  | 961.1  | 985.9  | 1031.9 | 1055.5 | 1050.8 | 1023.6 | 1029.5 |
| 72.5° | 1107.5 | 989.4  | 889.0  | 865.4  | 879.6  | 903.2  | 946.9  | 989.4  | 1014.2 | 1020.1 | 1033.1 |
| 75°   | 961.1  | 866.6  | 772.2  | 758.0  | 768.6  | 795.8  | 835.9  | 885.5  | 939.8  | 969.3  | 977.6  |
| 77.5° | 793.4  | 707.2  | 637.6  | 628.1  | 643.5  | 668.3  | 708.4  | 747.4  | 808.8  | 860.7  | 872.5  |
| 80°   | 621.0  | 546.6  | 497.1  | 488.8  | 498.2  | 519.5  | 550.2  | 582.1  | 641.1  | 681.2  | 687.1  |
| 82.5° | 430.9  | 386.1  | 354.2  | 349.5  | 355.4  | 363.6  | 388.4  | 418.0  | 451.0  | 482.9  | 486.4  |
| 85°   | 250.3  | 222.0  | 213.7  | 206.6  | 219.6  | 219.6  | 225.5  | 242.0  | 258.6  | 260.9  | 268.0  |
| 87.5° | 46.0   | 43.7   | 44.9   | 33.1   | 41.3   | 29.5   | 29.5   | 37.8   | 28.3   | 33.1   | 27.2   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

LM-79-08: Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

McGRAW-EDISON

Report Number: SP1-2006-844-1

Luminaire Tested: TT-D4-750-U-WQ

Data valid for TT-D\* and TTN families of products

Test Date: 11/06/2020

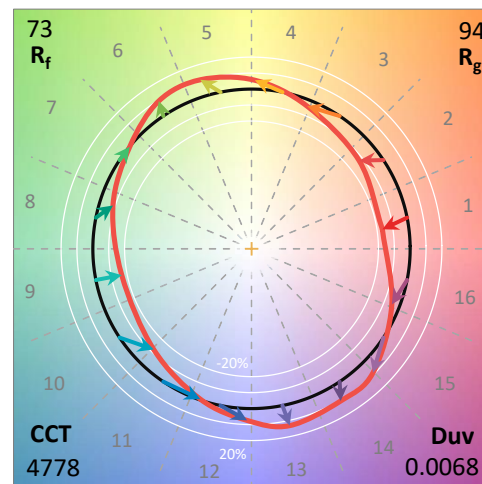
### Test Information

Test Method: LM-79-08  
 Report Number: SP1-2006-844-1  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Photometer: SP1  
 Measurement Geometry:  $4\pi$   
 Issue Date: 11/06/2020  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: MCGRAW-EDISON  
 Catalog Number: **TT-D4-750-U-WQ**  
 Description: MCGRAW EDISON

### DISTRIBUTION

### Spectral Parameters

|                           |        |           |      |      |       |
|---------------------------|--------|-----------|------|------|-------|
| CCT (K):                  | 4778   | CRI (Ra): | 71.0 |      |       |
| CIE u':                   | 0.2092 | R1:       | 67.7 | R9:  | -28.7 |
| CIE v':                   | 0.4955 | R2:       | 75.2 | R10: | 41.2  |
| Duv:                      | 0.0068 | R3:       | 80.8 | R11: | 67.2  |
| CIE x:                    | 0.3535 | R4:       | 71.5 | R12: | 35.9  |
| CIE y:                    | 0.3721 | R5:       | 67.8 | R13: | 68.5  |
| CIE z:                    | 0.2744 | R6:       | 65.6 | R14: | 89.2  |
| Peak Wavelength (nm):     | 449    | R7:       | 82.2 |      |       |
| Dominant Wavelength (nm): | 570    | R8:       | 57.2 |      |       |
| Purity:                   | 17.8   |           |      |      |       |
| Rf:                       | 73.3   |           |      |      |       |
| Rg:                       | 94.5   |           |      |      |       |



### Test Conditions

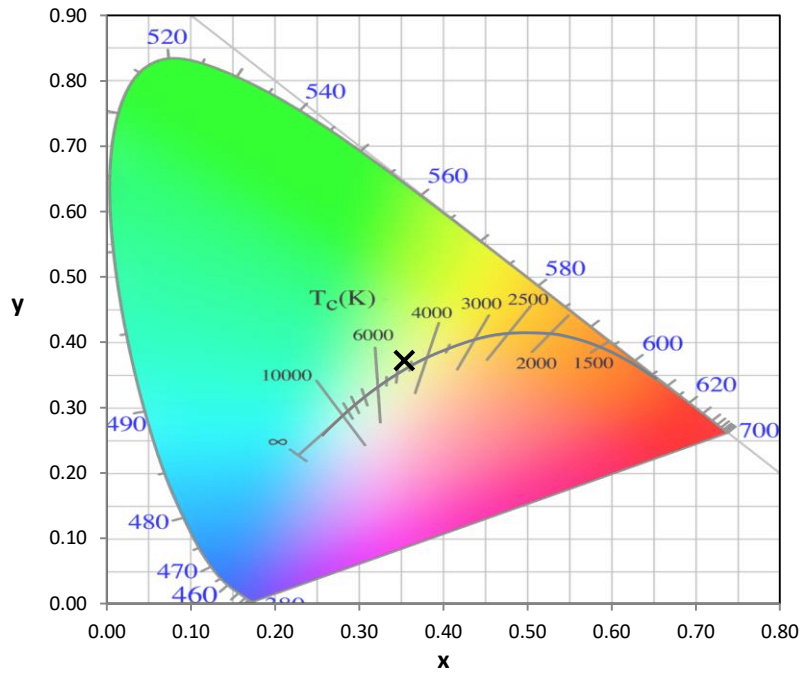
Stabilization Time: 62M  
 Operation Time: 12H  
 Room Temperature (°C) / RH%: 24.6/45%  
 Sphere Temperature (°C): 24.7

REPORT NUMBER: SP1-2006-844-1

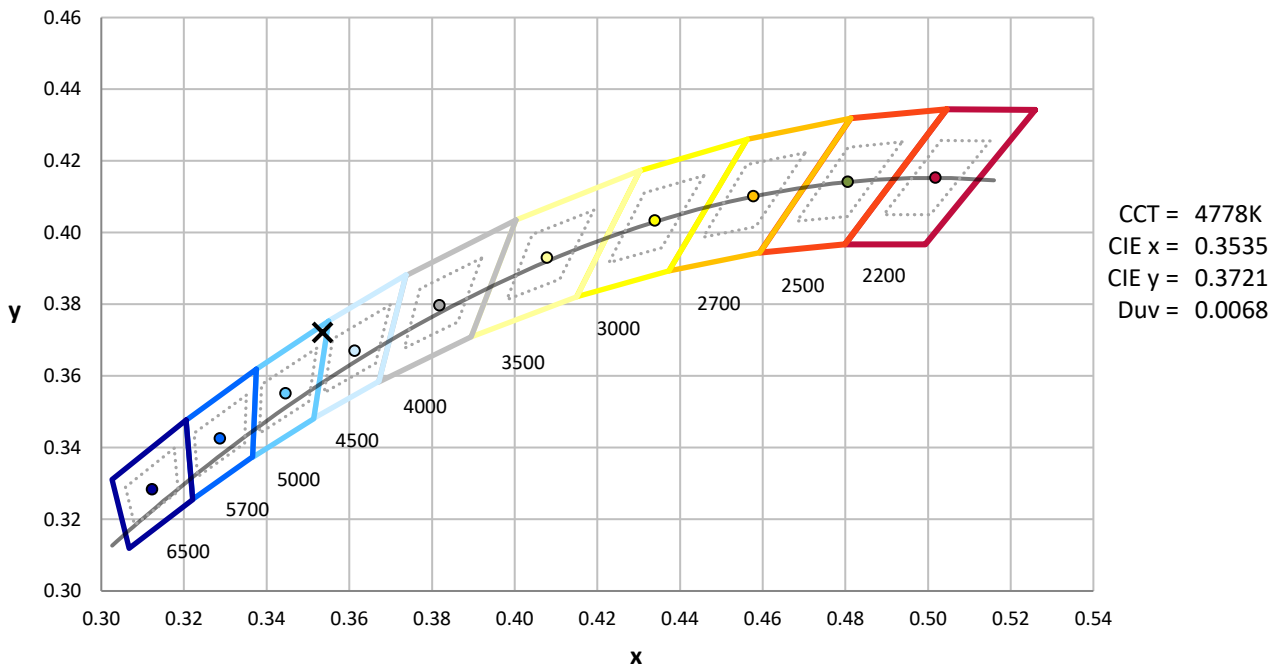
| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | IN0058                | 7/29/2020        | 1/29/2021            |
| Power Meter                    | IN0071                | 12/3/2019        | 12/3/2020            |
| AC Power Source                | IN0063                | 12/3/2019        | 12/3/2020            |
| DC Power Source                | IN0208                | 12/3/2019        | 12/3/2020            |
| Sphere Thermometer             | IN0085                | 12/3/2019        | 12/3/2020            |
| Room Thermometer               | IN0046                | 12/3/2019        | 12/3/2020            |

REPORT NUMBER: SP1-2006-844-1

**CIE 1931 Chromaticity Diagram**



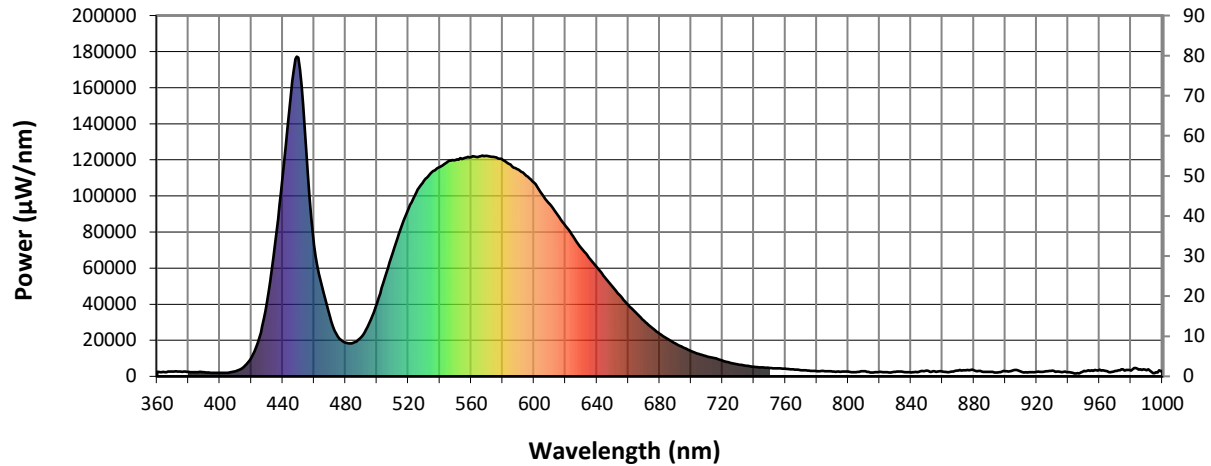
**CIE 1931 Chromaticity Diagram with 2017 ANSI 7-Step and 4-Step Quadrangles**



Point lies inside the ANSI 5000K 7-step quadrangle

REPORT NUMBER: SP1-2006-844-1

### Photopic Flux vs. Wavelength

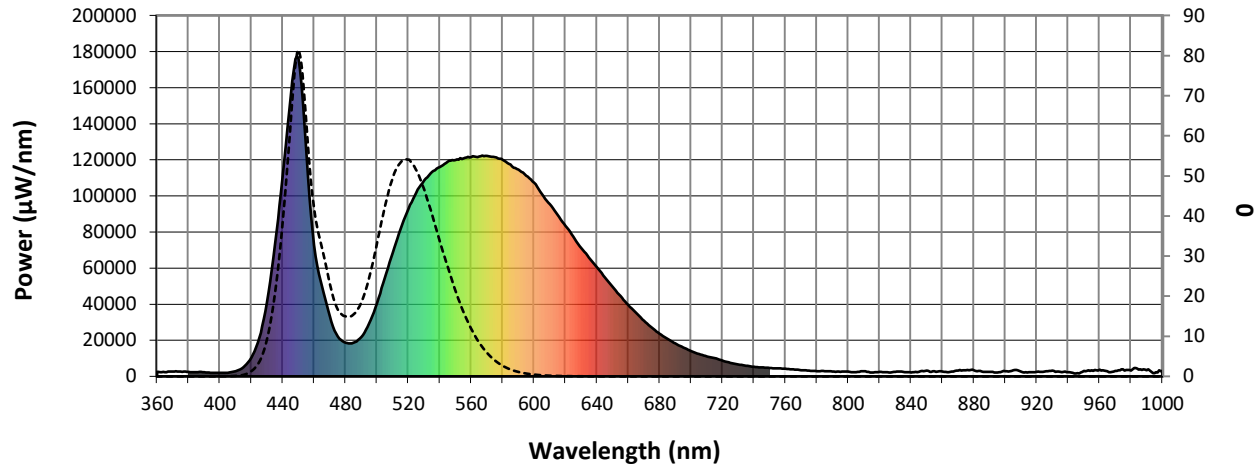


#####

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2529             | 0.0              | 490       | 21819            | 3.1              | 620       | 83437            | 21.7             | 750       | 4608             | 0.0              | 880       | 3335             | 0.0              |
| 365       | 2361             | 0.0              | 495       | 29270            | 5.3              | 625       | 77569            | 17.1             | 755       | 4412             | 0.0              | 885       | 2653             | 0.0              |
| 370       | 2648             | 0.0              | 500       | 40589            | 9.0              | 630       | 71183            | 12.9             | 760       | 4227             | 0.0              | 890       | 2411             | 0.0              |
| 375       | 2655             | 0.0              | 505       | 54498            | 15.2             | 635       | 65734            | 9.9              | 765       | 3922             | 0.0              | 895       | 2118             | 0.0              |
| 380       | 2428             | 0.0              | 510       | 68399            | 23.5             | 640       | 60418            | 7.2              | 770       | 3461             | 0.0              | 900       | 2873             | 0.0              |
| 385       | 2334             | 0.0              | 515       | 81428            | 33.7             | 645       | 54736            | 5.3              | 775       | 3226             | 0.0              | 905       | 3367             | 0.0              |
| 390       | 2269             | 0.0              | 520       | 92826            | 45.0             | 650       | 49620            | 3.6              | 780       | 2883             | 0.0              | 910       | 2749             | 0.0              |
| 395       | 2020             | 0.0              | 525       | 101684           | 54.6             | 655       | 44517            | 2.6              | 785       | 2864             | 0.0              | 915       | 2283             | 0.0              |
| 400       | 1873             | 0.0              | 530       | 108580           | 63.9             | 660       | 39493            | 1.6              | 790       | 2715             | 0.0              | 920       | 2425             | 0.0              |
| 405       | 2015             | 0.0              | 535       | 113290           | 70.3             | 665       | 35066            | 1.1              | 795       | 2547             | 0.0              | 925       | 2705             | 0.0              |
| 410       | 2831             | 0.0              | 540       | 116042           | 75.6             | 670       | 30825            | 0.7              | 800       | 2585             | 0.0              | 930       | 3144             | 0.0              |
| 415       | 5121             | 0.0              | 545       | 118948           | 79.2             | 675       | 27031            | 0.5              | 805       | 2308             | 0.0              | 935       | 2539             | 0.0              |
| 420       | 10348            | 0.0              | 550       | 119916           | 81.5             | 680       | 23555            | 0.3              | 810       | 2796             | 0.0              | 940       | 2288             | 0.0              |
| 425       | 21288            | 0.1              | 555       | 120734           | 82.5             | 685       | 20841            | 0.2              | 815       | 2196             | 0.0              | 945       | 1604             | 0.0              |
| 430       | 41173            | 0.3              | 560       | 121523           | 82.6             | 690       | 18232            | 0.1              | 820       | 2415             | 0.0              | 950       | 3031             | 0.0              |
| 435       | 73003            | 0.9              | 565       | 121859           | 81.0             | 695       | 16035            | 0.1              | 825       | 2281             | 0.0              | 955       | 3356             | 0.0              |
| 440       | 111013           | 1.7              | 570       | 122246           | 79.5             | 700       | 14010            | 0.0              | 830       | 2524             | 0.0              | 960       | 3704             | 0.0              |
| 445       | 154787           | 3.2              | 575       | 121449           | 75.6             | 705       | 12408            | 0.0              | 835       | 2461             | 0.0              | 965       | 2847             | 0.0              |
| 450       | 176733           | 4.6              | 580       | 120111           | 71.4             | 710       | 11063            | 0.0              | 840       | 2195             | 0.0              | 970       | 2985             | 0.0              |
| 455       | 124334           | 4.2              | 585       | 117354           | 65.2             | 715       | 10136            | 0.0              | 845       | 2487             | 0.0              | 975       | 3963             | 0.0              |
| 460       | 72664            | 3.0              | 590       | 114565           | 59.2             | 720       | 8693             | 0.0              | 850       | 3144             | 0.0              | 980       | 3221             | 0.0              |
| 465       | 49806            | 2.6              | 595       | 111127           | 52.7             | 725       | 7522             | 0.0              | 855       | 2809             | 0.0              | 985       | 3794             | 0.0              |
| 470       | 32995            | 2.1              | 600       | 107253           | 46.2             | 730       | 6612             | 0.0              | 860       | 2621             | 0.0              | 990       | 3296             | 0.0              |
| 475       | 22184            | 1.7              | 605       | 101156           | 39.2             | 735       | 5947             | 0.0              | 865       | 2410             | 0.0              | 995       | 1779             | 0.0              |
| 480       | 18691            | 1.8              | 610       | 95370            | 32.8             | 740       | 5253             | 0.0              | 870       | 3143             | 0.0              | 1000      | 2977             | 0.0              |
| 485       | 18593            | 2.2              | 615       | 89556            | 27.0             | 745       | 5032             | 0.0              | 875       | 3421             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2006-844-1

### Scotopic Flux vs. Wavelength



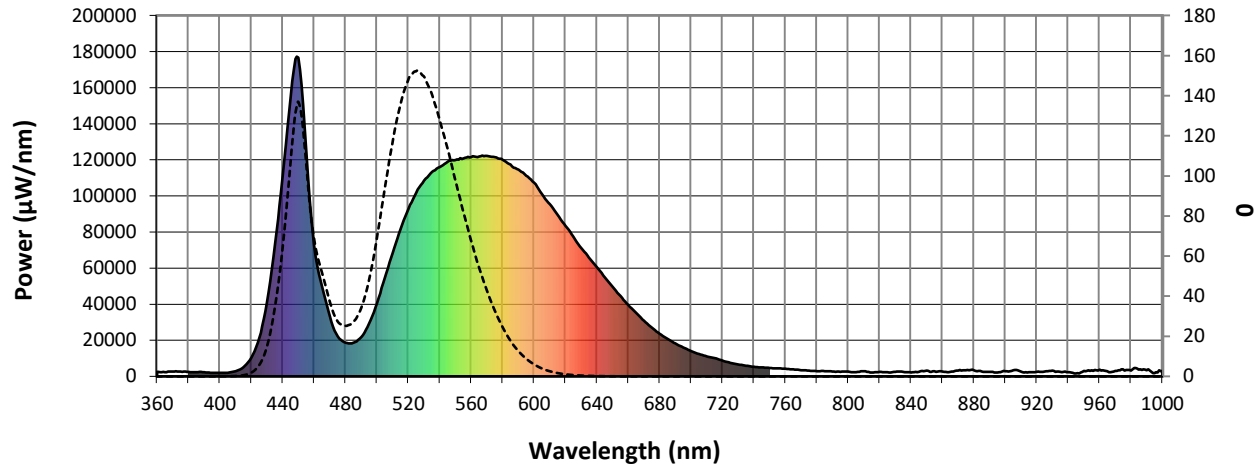
Scotopic Lumens: 4867.6

S/P: 0.66

| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2529             | 0.0              | 490       | 21819            | 33.6             | 620       | 83437            | 1.0              | 750       | 4608             | 0.0              | 880       | 3335             | 0.0              |
| 365       | 2361             | 0.0              | 495       | 29270            | 47.3             | 625       | 77569            | 0.7              | 755       | 4412             | 0.0              | 885       | 2653             | 0.0              |
| 370       | 2648             | 0.0              | 500       | 40589            | 67.9             | 630       | 71183            | 0.4              | 760       | 4227             | 0.0              | 890       | 2411             | 0.0              |
| 375       | 2655             | 0.0              | 505       | 54498            | 92.6             | 635       | 65734            | 0.2              | 765       | 3922             | 0.0              | 895       | 2118             | 0.0              |
| 380       | 2428             | 0.0              | 510       | 68399            | 115.9            | 640       | 60418            | 0.2              | 770       | 3461             | 0.0              | 900       | 2873             | 0.0              |
| 385       | 2334             | 0.0              | 515       | 81428            | 135.0            | 645       | 54736            | 0.1              | 775       | 3226             | 0.0              | 905       | 3367             | 0.0              |
| 390       | 2269             | 0.0              | 520       | 92826            | 147.5            | 650       | 49620            | 0.1              | 780       | 2883             | 0.0              | 910       | 2749             | 0.0              |
| 395       | 2020             | 0.0              | 525       | 101684           | 152.1            | 655       | 44517            | 0.0              | 785       | 2864             | 0.0              | 915       | 2283             | 0.0              |
| 400       | 1873             | 0.0              | 530       | 108580           | 149.7            | 660       | 39493            | 0.0              | 790       | 2715             | 0.0              | 920       | 2425             | 0.0              |
| 405       | 2015             | 0.1              | 535       | 113290           | 141.2            | 665       | 35066            | 0.0              | 795       | 2547             | 0.0              | 925       | 2705             | 0.0              |
| 410       | 2831             | 0.2              | 540       | 116042           | 128.2            | 670       | 30825            | 0.0              | 800       | 2585             | 0.0              | 930       | 3144             | 0.0              |
| 415       | 5121             | 0.5              | 545       | 118948           | 114.0            | 675       | 27031            | 0.0              | 805       | 2308             | 0.0              | 935       | 2539             | 0.0              |
| 420       | 10348            | 1.7              | 550       | 119916           | 98.1             | 680       | 23555            | 0.0              | 810       | 2796             | 0.0              | 940       | 2288             | 0.0              |
| 425       | 21288            | 5.2              | 555       | 120734           | 82.5             | 685       | 20841            | 0.0              | 815       | 2196             | 0.0              | 945       | 1604             | 0.0              |
| 430       | 41173            | 14.0             | 560       | 121523           | 67.9             | 690       | 18232            | 0.0              | 820       | 2415             | 0.0              | 950       | 3031             | 0.0              |
| 435       | 73003            | 32.6             | 565       | 121859           | 54.7             | 695       | 16035            | 0.0              | 825       | 2281             | 0.0              | 955       | 3356             | 0.0              |
| 440       | 111013           | 62.0             | 570       | 122246           | 43.1             | 700       | 14010            | 0.0              | 830       | 2524             | 0.0              | 960       | 3704             | 0.0              |
| 445       | 154787           | 103.6            | 575       | 121449           | 33.1             | 705       | 12408            | 0.0              | 835       | 2461             | 0.0              | 965       | 2847             | 0.0              |
| 450       | 176733           | 137.0            | 580       | 120111           | 24.7             | 710       | 11063            | 0.0              | 840       | 2195             | 0.0              | 970       | 2985             | 0.0              |
| 455       | 124334           | 108.6            | 585       | 117354           | 17.9             | 715       | 10136            | 0.0              | 845       | 2487             | 0.0              | 975       | 3963             | 0.0              |
| 460       | 72664            | 70.2             | 590       | 114565           | 12.8             | 720       | 8693             | 0.0              | 850       | 3144             | 0.0              | 980       | 3221             | 0.0              |
| 465       | 49806            | 52.6             | 595       | 111127           | 8.9              | 725       | 7522             | 0.0              | 855       | 2809             | 0.0              | 985       | 3794             | 0.0              |
| 470       | 32995            | 38.0             | 600       | 107253           | 6.0              | 730       | 6612             | 0.0              | 860       | 2621             | 0.0              | 990       | 3296             | 0.0              |
| 475       | 22184            | 27.7             | 605       | 101156           | 4.0              | 735       | 5947             | 0.0              | 865       | 2410             | 0.0              | 995       | 1779             | 0.0              |
| 480       | 18691            | 25.2             | 610       | 95370            | 2.6              | 740       | 5253             | 0.0              | 870       | 3143             | 0.0              | 1000      | 2977             | 0.0              |
| 485       | 18593            | 27.0             | 615       | 89556            | 1.7              | 745       | 5032             | 0.0              | 875       | 3421             | 0.0              |           |                  |                  |

REPORT NUMBER: SP1-2006-844-1

### Melanopic Flux vs. Wavelength

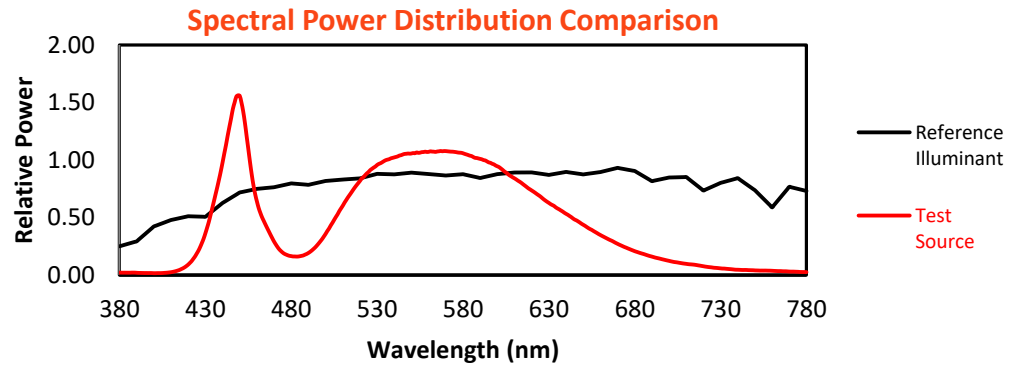


**Melanopic Lumens: 12457.9**    **S/P: 1.7**

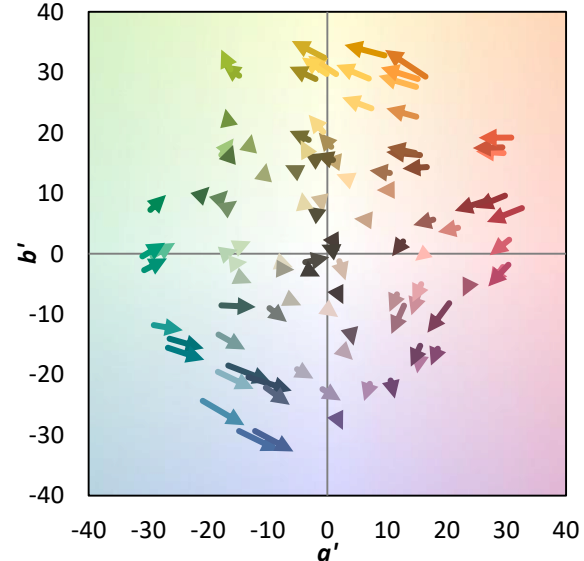
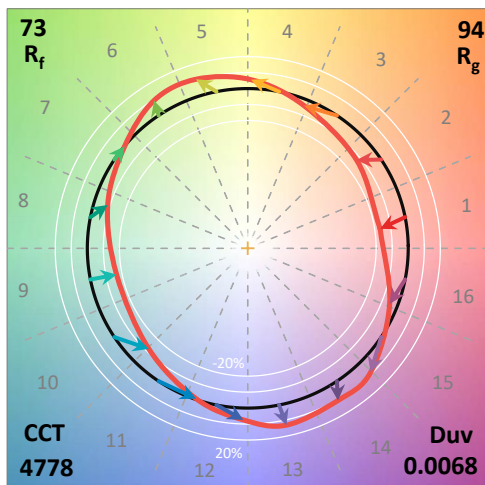
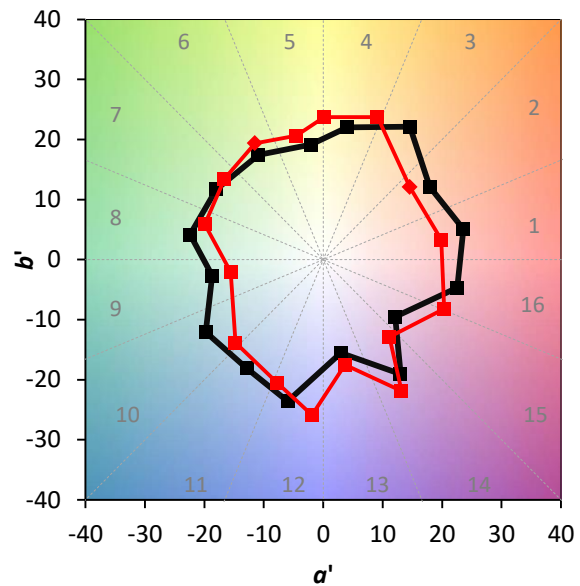
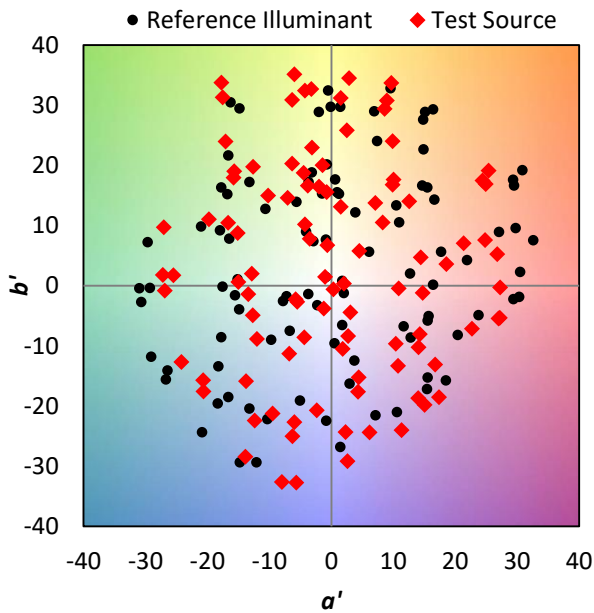
| λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) | λ<br>(nm) | Power<br>(μW/nm) | Lumens<br>(Φ/nm) |
|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|-----------|------------------|------------------|
| 360       | 2529             | 0.0              | 490       | 21819            | 18.2             | 620       | 83437            | 0.1              | 750       | 4608             | 0.0              | 880       | 3335             | 0.0              |
| 365       | 2361             | 0.0              | 495       | 29270            | 24.2             | 625       | 77569            | 0.0              | 755       | 4412             | 0.0              | 885       | 2653             | 0.0              |
| 370       | 2648             | 0.0              | 500       | 40589            | 32.6             | 630       | 71183            | 0.0              | 760       | 4227             | 0.0              | 890       | 2411             | 0.0              |
| 375       | 2655             | 0.0              | 505       | 54498            | 41.8             | 635       | 65734            | 0.0              | 765       | 3922             | 0.0              | 895       | 2118             | 0.0              |
| 380       | 2428             | 0.0              | 510       | 68399            | 49.1             | 640       | 60418            | 0.0              | 770       | 3461             | 0.0              | 900       | 2873             | 0.0              |
| 385       | 2334             | 0.0              | 515       | 81428            | 53.2             | 645       | 54736            | 0.0              | 775       | 3226             | 0.0              | 905       | 3367             | 0.0              |
| 390       | 2269             | 0.0              | 520       | 92826            | 54.0             | 650       | 49620            | 0.0              | 780       | 2883             | 0.0              | 910       | 2749             | 0.0              |
| 395       | 2020             | 0.0              | 525       | 101684           | 51.6             | 655       | 44517            | 0.0              | 785       | 2864             | 0.0              | 915       | 2283             | 0.0              |
| 400       | 1873             | 0.0              | 530       | 108580           | 46.9             | 660       | 39493            | 0.0              | 790       | 2715             | 0.0              | 920       | 2425             | 0.0              |
| 405       | 2015             | 0.0              | 535       | 113290           | 40.8             | 665       | 35066            | 0.0              | 795       | 2547             | 0.0              | 925       | 2705             | 0.0              |
| 410       | 2831             | 0.1              | 540       | 116042           | 34.0             | 670       | 30825            | 0.0              | 800       | 2585             | 0.0              | 930       | 3144             | 0.0              |
| 415       | 5121             | 0.3              | 545       | 118948           | 27.6             | 675       | 27031            | 0.0              | 805       | 2308             | 0.0              | 935       | 2539             | 0.0              |
| 420       | 10348            | 1.2              | 550       | 119916           | 21.5             | 680       | 23555            | 0.0              | 810       | 2796             | 0.0              | 940       | 2288             | 0.0              |
| 425       | 21288            | 3.3              | 555       | 120734           | 16.3             | 685       | 20841            | 0.0              | 815       | 2196             | 0.0              | 945       | 1604             | 0.0              |
| 430       | 41173            | 8.7              | 560       | 121523           | 12.0             | 690       | 18232            | 0.0              | 820       | 2415             | 0.0              | 950       | 3031             | 0.0              |
| 435       | 73003            | 19.5             | 565       | 121859           | 8.6              | 695       | 16035            | 0.0              | 825       | 2281             | 0.0              | 955       | 3356             | 0.0              |
| 440       | 111013           | 37.1             | 570       | 122246           | 6.0              | 700       | 14010            | 0.0              | 830       | 2524             | 0.0              | 960       | 3704             | 0.0              |
| 445       | 154787           | 61.1             | 575       | 121449           | 4.0              | 705       | 12408            | 0.0              | 835       | 2461             | 0.0              | 965       | 2847             | 0.0              |
| 450       | 176733           | 81.4             | 580       | 120111           | 2.7              | 710       | 11063            | 0.0              | 840       | 2195             | 0.0              | 970       | 2985             | 0.0              |
| 455       | 124334           | 65.1             | 585       | 117354           | 1.7              | 715       | 10136            | 0.0              | 845       | 2487             | 0.0              | 975       | 3963             | 0.0              |
| 460       | 72664            | 42.8             | 590       | 114565           | 1.1              | 720       | 8693             | 0.0              | 850       | 3144             | 0.0              | 980       | 3221             | 0.0              |
| 465       | 49806            | 32.5             | 595       | 111127           | 0.7              | 725       | 7522             | 0.0              | 855       | 2809             | 0.0              | 985       | 3794             | 0.0              |
| 470       | 32995            | 23.6             | 600       | 107253           | 0.5              | 730       | 6612             | 0.0              | 860       | 2621             | 0.0              | 990       | 3296             | 0.0              |
| 475       | 22184            | 16.9             | 605       | 101156           | 0.3              | 735       | 5947             | 0.0              | 865       | 2410             | 0.0              | 995       | 1779             | 0.0              |
| 480       | 18691            | 15.0             | 610       | 95370            | 0.2              | 740       | 5253             | 0.0              | 870       | 3143             | 0.0              | 1000      | 2977             | 0.0              |
| 485       | 18593            | 15.3             | 615       | 89556            | 0.1              | 745       | 5032             | 0.0              | 875       | 3421             | 0.0              |           |                  |                  |

### Summary

$R_f = 73.3$   
 $R_g = 94.5$   
 CIE  $R_a = 71.0$   
 $R_g = -28.7$

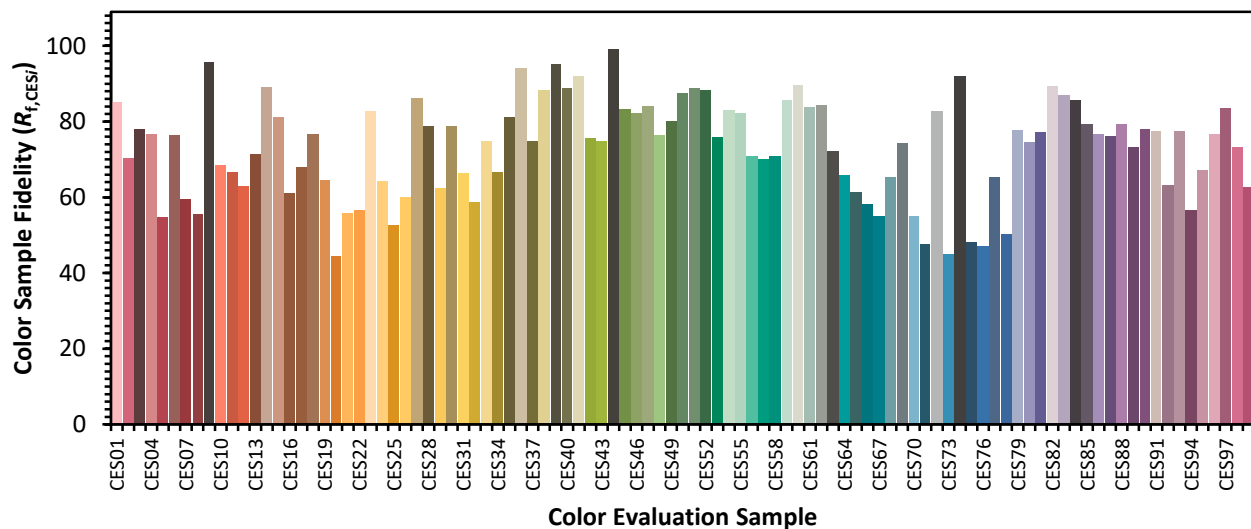


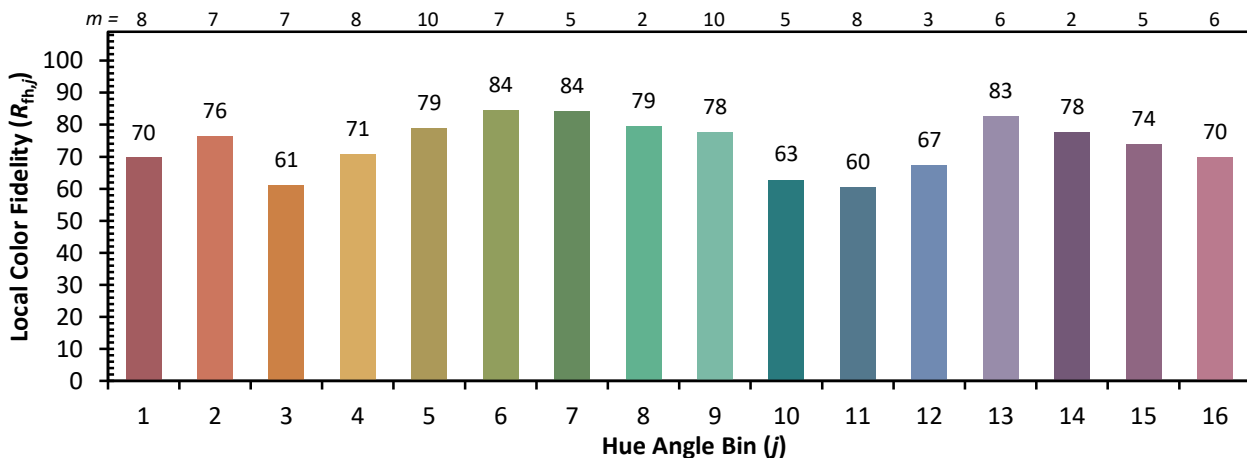
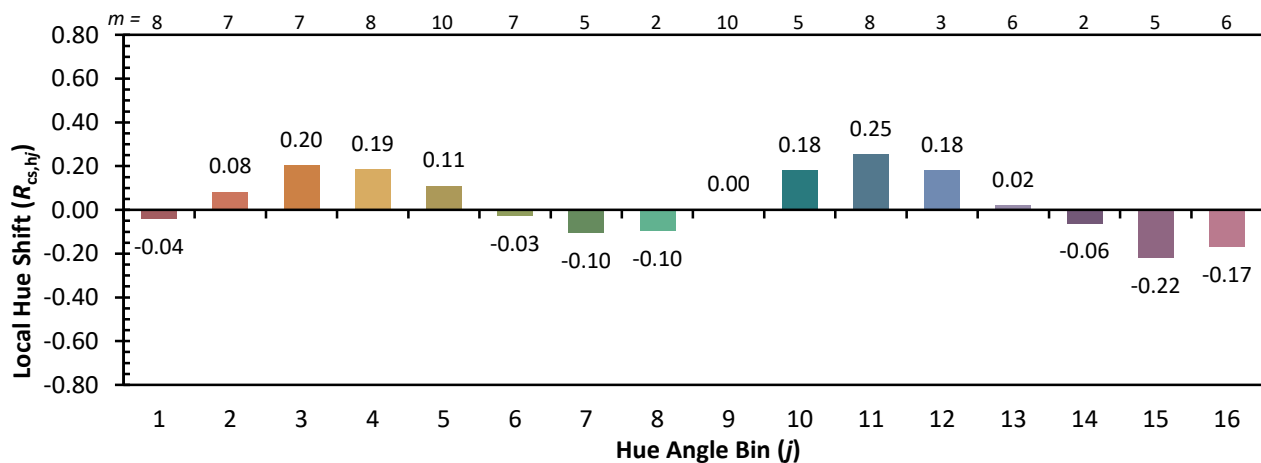
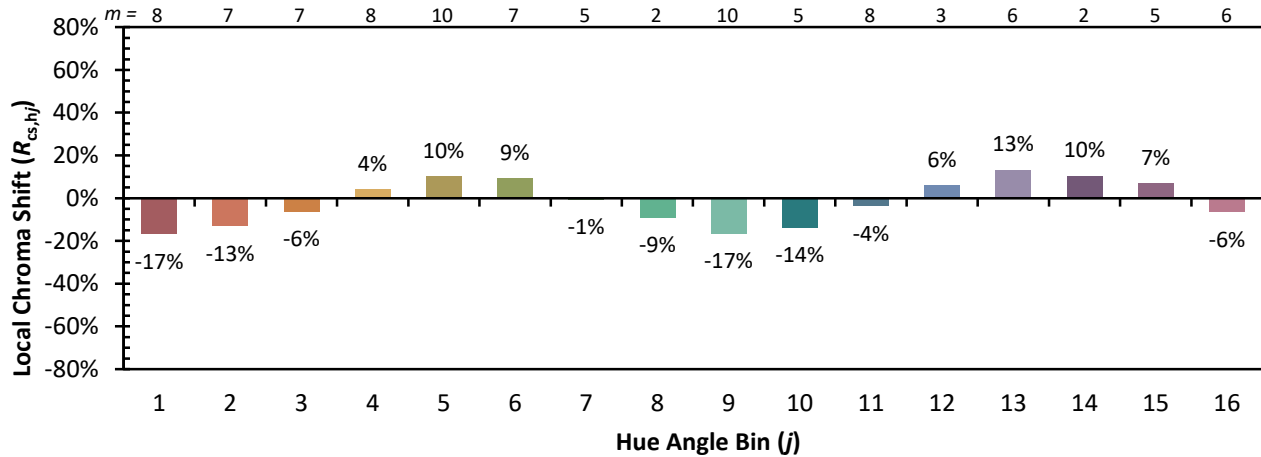
### Color Vector Graphics



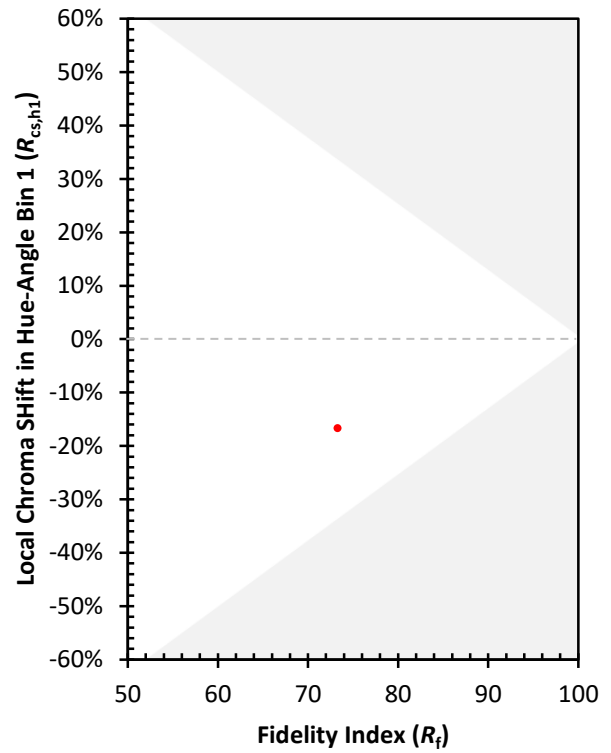
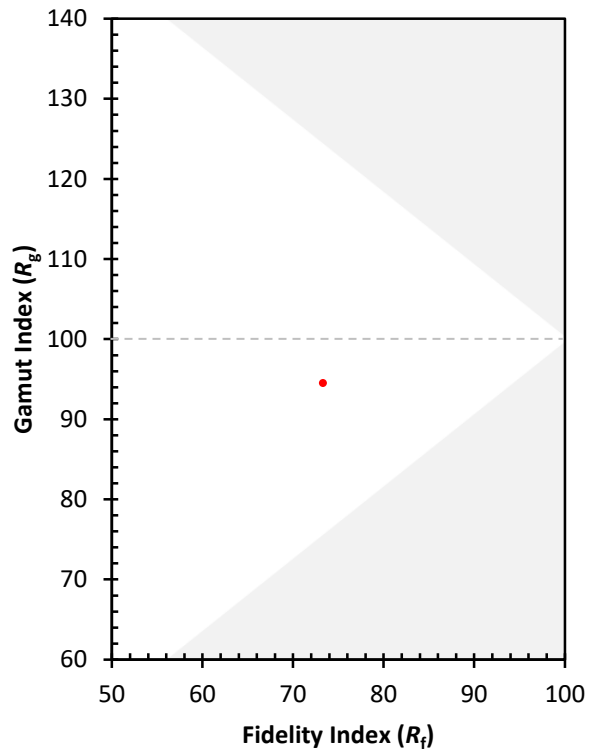
**Individual Sample Fidelity Index ( $R_{f,i}$ )**

|            |            |            |            |
|------------|------------|------------|------------|
| CES01 = 85 | CES26 = 60 | CES51 = 89 | CES76 = 47 |
| CES02 = 59 | CES27 = 86 | CES52 = 88 | CES77 = 65 |
| CES03 = 30 | CES28 = 79 | CES53 = 76 | CES78 = 50 |
| CES04 = 69 | CES29 = 62 | CES54 = 83 | CES79 = 78 |
| CES05 = 46 | CES30 = 79 | CES55 = 82 | CES80 = 74 |
| CES06 = 50 | CES31 = 66 | CES56 = 71 | CES81 = 77 |
| CES07 = 39 | CES32 = 59 | CES57 = 70 | CES82 = 89 |
| CES08 = 38 | CES33 = 75 | CES58 = 71 | CES83 = 87 |
| CES09 = 29 | CES34 = 67 | CES59 = 86 | CES84 = 86 |
| CES10 = 72 | CES35 = 81 | CES60 = 90 | CES85 = 79 |
| CES11 = 56 | CES36 = 94 | CES61 = 84 | CES86 = 77 |
| CES12 = 61 | CES37 = 75 | CES62 = 84 | CES87 = 76 |
| CES13 = 41 | CES38 = 88 | CES63 = 72 | CES88 = 79 |
| CES14 = 74 | CES39 = 95 | CES64 = 66 | CES89 = 73 |
| CES15 = 70 | CES40 = 89 | CES65 = 61 | CES90 = 78 |
| CES16 = 46 | CES41 = 92 | CES66 = 58 | CES91 = 77 |
| CES17 = 49 | CES42 = 75 | CES67 = 55 | CES92 = 63 |
| CES18 = 55 | CES43 = 75 | CES68 = 65 | CES93 = 78 |
| CES19 = 71 | CES44 = 99 | CES69 = 74 | CES94 = 57 |
| CES20 = 64 | CES45 = 83 | CES70 = 55 | CES95 = 67 |
| CES21 = 85 | CES46 = 82 | CES71 = 48 | CES96 = 77 |
| CES22 = 77 | CES47 = 84 | CES72 = 83 | CES97 = 84 |
| CES23 = 91 | CES48 = 76 | CES73 = 45 | CES98 = 73 |
| CES24 = 90 | CES49 = 80 | CES74 = 92 | CES99 = 63 |
| CES25 = 71 | CES50 = 88 | CES75 = 48 |            |



**Color Rendition by Hue-Angle Bin**


**Measure Comparisons**



(END OF REPORT)